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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|-------------------------|------------------|
| 10/675,258 | 09/30/2003 | Seung H. Kang | AYUKAWA 1-4-1-162-30 | 4017 |
| 47396 | 7590 | 03/19/2007 | EXAMINER | |
| HITT GAINES, PC AGERE SYSTEMS INC. PO BOX 832570 RICHARDSON, TX 75083 | | | LE, THAO X | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2814 | |

| SHORTENED STATUTORY PERIOD OF RESPONSE | NOTIFICATION DATE | DELIVERY MODE |
|--|-------------------|---------------|
| 3 MONTHS | 03/19/2007 | ELECTRONIC |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 03/19/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docket@hittgaines.com

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/675,258 | KANG ET AL. | |
| | Examiner | Art Unit | |
| | Thao X. Le | 2814 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 8-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-16 and 26-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-4, 6, 8-10, 12-16, and 26 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6614091 to Downey et al.

Regarding claims 1, Downey discloses an integrated circuit (IC) device in fig. 2 comprising: a semiconductor substrate 26, col. 2 line 54, a metallization interconnect system 28-32, col. 3 line 40, overlying the semiconductor substrate 26, the metallization interconnect system including multiple first interconnect structure 28 located within a dielectric layer, col. 3 line 41, a bond pad level 53/18 comprising a contact pad (interface between 53 and 28 where 51 and 52 are located or left portion of pad 53), fig. 2, overlying the metallization interconnect system, fig. 2, the contact pad configured for connection external to the device, col. 4 line 8, and a second interconnect structure 53 (right portion of pad 53), col. 3 line 30, connected to the contact pad, fig. 2, wherein a portion of the second interconnect structure is disposed in the bond pad level, the

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second interconnect structure 53 being in physical contact with the multiple first interconnect structures 28 located within the dielectric layer, fig. 2.

Regarding claims 2-3, and 13-14, Downey discloses the IC device wherein a material of the metallization interconnect system comprises copper, col. 3 line 52, wherein a material of the contact pad comprises aluminum, column 3 line 30.

Regarding claim 4, Downey discloses the IC wherein the contact pad is configured for connection external to the device by a bond wire attached, col. 3 line 64.

Regarding claim 6, Downey discloses the IC device wherein a material of the metallization interconnect system comprises copper, col. 3 line 52 and contact pad comprises aluminum, col. 3 line 30, further comprising a barrier material between the copper and the aluminum in the region where the second interconnect structure 53 is in physical contact with the multiple first interconnect structures 28 (or 51/52) located within the dielectric layer, fig. 2 col. 3 lines 19-25.

Regarding claim 8-9,15-16, Downey discloses the IC device wherein the metallization interconnect system further comprises substantially horizontal conductive copper runners 30, fig. 2, and substantially vertical conductive vias interconnecting overlying and underlying copper, col.3 line 52.

Regarding claim 10, Downey discloses the IC further comprising a passivation layer 18, column 2 line 54, disposed between the second interconnect structure 53 and the dielectric layer, fig 2.

Regarding claim 12, Downey discloses an integrated circuit (IC) device comprising: a metallization interconnect system, fig. 2, located over a substrate 26, the

metallization system including multiple first interconnect structure 28 with a dielectric layer, col. 3 line 41, a plurality of contact pads (interface between 53 and 28 where 51 and 52 are located or left portion of pad 53) disposed over the metallization interconnect system, one or more of the plurality of contact pads configured for connection external to the device, col. 4 line 8, line 33, and a second interconnect structure 53 (right portion of 53) coplanar with at least one of the plurality of contact pads and electrically connected thereto, the second interconnect structure 53 comprising a plurality of conductive elements physically contacting the multiple first interconnect structure 28, fig. 2.

Regarding claim 26, Downey discloses the IC wherein at least a portion of the second interconnects structure 53 is disposed above the contact pad, fig. 2.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 5, and 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6614091 to Downey et al. in view of US 6979896 to Seshan.

Regarding claims 5 and 27-28, Downey does not disclose the IC device wherein contact pad is configured for connection external to the device by a solder bump attached thereto, and wherein the second interconnect structure is a power bus.

However, Seshan discloses the IC device in fig. 5 wherein contact pad 208, col. 4 line 25, is configured for connection external to the device by a solder bump 22, col. 4 line 17, attached thereto. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the solder bump teaching of Seshan with Downey, because it would have provided for communicating power and signal to and from circuitry of the IC as taught by Seshan, col. 2 lines 1-2.

With respect to "power bus", the either the metal pad 208 of Seshan or metal pad 53 of Downey obviously can be a power bus that can carry power or signal.

6. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6614091 to Downey et al. in view of Applicant Admitted Prior Art (AAPA)

Regarding claim 11, Downey does not disclose the IC further comprising a passivation layer overlying the bond pad level.

However, AAPA discloses a IC comprises a passivation layer 158 [0032] overlying the bond pad level. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the passivation teaching of AAPA with Downey's device, because the passivation layer would have provided the protection to the aluminum layer and or for further making interconnecting layer.

Response to Arguments

7. Applicant's arguments filed 01/10/07 have been fully considered but they are not persuasive. The Applicant argues that Downey does not disclose the second interconnect structure contact a contact pad and at least two first interconnect structure. The Examiner respectfully disagrees because

- a. The claim language does not require the second interconnect structure contacts at least two first interconnect structure. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).
- b. It is well settled that, during examination proceedings, claims are given their broadest reasonable interpretation and a claim must be read in accordance with the percepts of English grammar and words should be given their plain, ordinary meaning. In *re Hyatt*, 708 F2d 712, 218 USPQ 195 (Fed. Cir. 1983). In this case, the left portion of the bond pad 53 is considered to be a contact pad,

while the right portion of 53 bond pad portion is considered to be the second interconnect structure. Such structure would be equivalent to the claimed structure.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

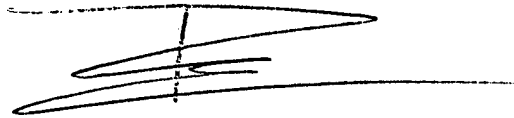
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thao X. Le whose telephone number is (571) 272-1708. The examiner can normally be reached on M-F from 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on (571) 272 -1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

14 Mar. 2007



THAO X. LE
PRIMARY PATENT EXAMINER